# How NIST Responds to Standards Needs in a Dynamic World

## Presentation to the NIST Visiting Committee

## June 2008

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Presentation by Information Technology Laboratory and Technology Services

NIST
National Institute of Standards and Technology
Technology Administration
U.S. Department of Commerce

# Summary

- Standards leadership is core to NIST's mission
  - Significant resource commitment
  - Strong international engagement
  - Influence at both technical and policy levels
  - Focus on improving both the development process as well as the content of standards
  - Essential coordination role with public and private sectors
  - NIST brings unique expertise and perspective to the table
- Standards system is complex, both in US and globally

# Standards Venues – Complex Global Scene

- > 200 ANSI-accredited standards organizations
- ~ 30 non-governmental and intergovernmental international bodies
- ~200 foreign national standards bodies and regional bodies
- > 300 consortia

- NIST does not try to cover all of the above
- Participation is broad but selective
- NIST works closely with ANSI, which has responsibility for US private sector coordination

# Why So Many Venues?

- Policy considerations
  - regulators often prefer to work in treaty organizations
- Legal implications
  - for companies, there may be issues related to IPR, perceived market dominance, etc.
- Business strategies
  - national activities vs. international, formal vs. consortia, etc.
- Market dynamics
  - the stage of technology development and market locations influence venue choices as well

# Standards Policy Issues Impacting US in the Global Market

- Lack of acceptance by some other governments of “multiple paths” to international standards
- Competition at all levels (among companies, among nations and regions, among standards bodies)
- Government role in industrial standards strategy
  - Different approaches in the U.S., China, and Europe, with the latter two being more top down
- Intellectual property rights

# What Drives NIST Standards Engagement Strategy?

Combination of “Top Down” and “Bottom Up”

Technology transfer (bottom up)

- Standards participation aligned with NIST research programs
- An important means of disseminating NIST research results into industrial practice

Administration R&D budget priorities

- Energy and climate change technology
- Advanced networking and information technology
- Nanotechnology
- Complex biological systems
- Environment
- Homeland security

Congressional and Administration mandates

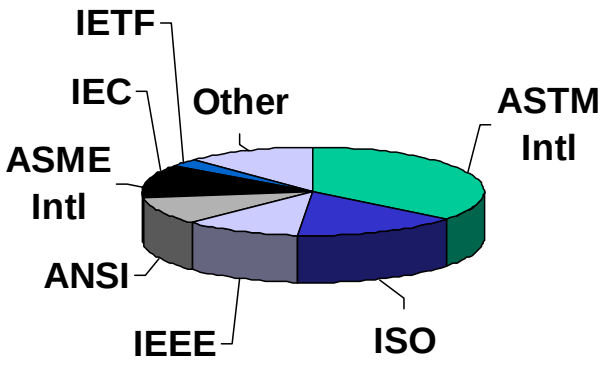
- E.g. voting systems, IT security, …

# What Does NIST “Bring to the Table”?

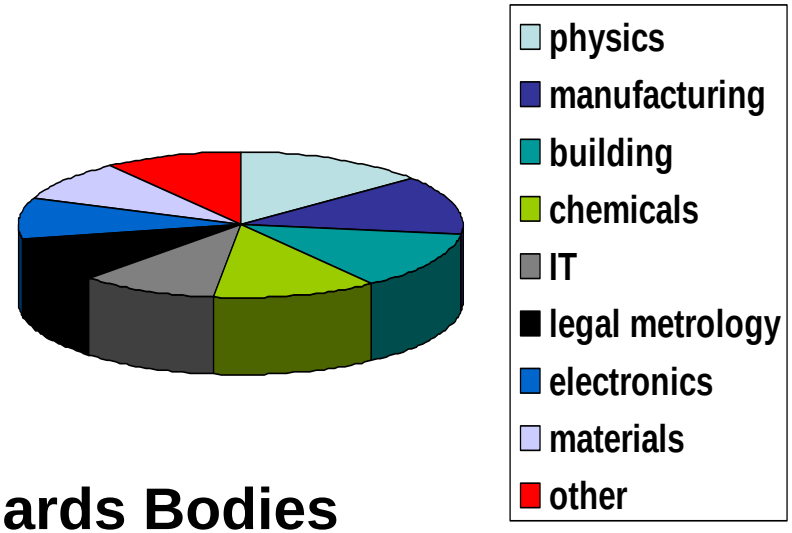
- Unbiased broker
- Leadership – both at policy and technical level
- Technical expertise
- Measurement & testing to guide choices
- Standards drafting
- Process integrity
- Important coordination responsibilities

# Focus of NIST's Participation

## Venues




## Technical Focus




**403 NIST staff in 107 Standards Bodies**

- 80% in bodies with international scope
- 163 are chair/co-chair positions
- 13 are policy board positions, including
  - •ASTM Board Chair
  - •ISO Vice-President
  - •IEEE Standards President
  - •ANSI ISO and International Policy Committee Chairs

# Results: Increasing US Influence Internationally

- Expanded use of ASTM, IEEE, ASME, … standards in many other countries
- Changes to ISO and IEC strategy and policies
  - Global relevance policy
  - IEEE/ISO and IEEE/IEC partnership agreements
- Strong engagement with other governments to recognize credibility of U.S. standards and the integrity of development process in their policies and procedures

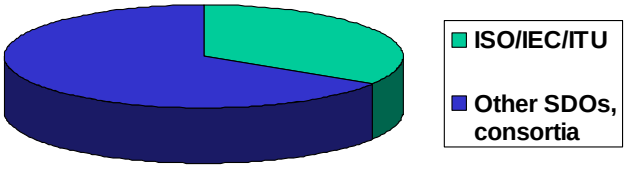
# Results: Assessing the Impact of NIST-supported Standards

Case study of NIST contribution to 76 standards efforts with documented industry/societal impact

Examples

- Wireless broadband
- Fire test methods
- Radiation detectors
- In vitro diagnostics
- And many others

Venues




| | |
|---|---|
| Wireless Broadband Standards (IEEE 802.16 / WiMAX | NIST at the forefront of developing common open standards for broadband wireless networks |
| Fire Test Methods & Standards | NIST leads U.S. efforts on fire test standards development.<br>- Since 1970's approximately 2,000 lives saved annually;<br>- Standards have a large social and monetary impact nationally |
| In Vitro Diagnostics (IVD) | NIST developed many methods and materials used by industry.<br>- NIST key leadership roles in CLSI, JCTLM, and U.S. TAG for ISO TC 212 **resulted** in several ISO standards that benefit U.S. industry<br><br>U.S firms currently have 60% of the approximately $6B/yr IVD medical device market in Europe |
| Radiation Detector Certification | NIST drove development of 4 standards for radiation detector certification for four classes of detectors ranging from hand-held instruments to monitors used for trucks and cargo containers |

# What Do Stakeholders Want?

- Flexible, timely standards development options
- Globally accepted, technology-neutral standards solutions
- Harmonized standards
- Measurement capabilities that support standardization for innovative, dynamic technologies

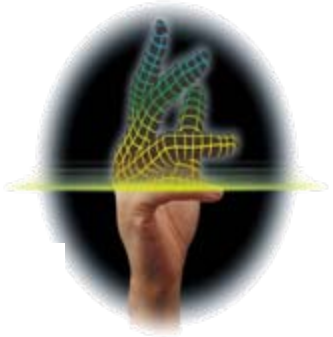
# Improving Timeliness of Standards

- Goal is to have standards when needed by the market
  - “Timely” is relative
  - Vendor time-to-market pressures
  - User deployment dates
  - End-of-life for existing standard
- NIST participates in and sometimes initiates consortia when needed
- NIST encourages streamlining processes in key SDOs through active leadership roles

# Three Examples

- Information Technology (Biometrics)
- Nanotechnology
- Renewable Energy (Biofuels)

# Biometric Standardization



**NIST Approach**

Based upon post 9/11 priorities, accelerate generic biometric standardization

Champion establishment of INCITS M1 (2001) and ISO/IEC JTC 1/SC 37 (2002) for development of national/international biometric standards

Provide M1 & SC 37 Chairs and administrative support for M1 & SC 37

Provide technical experts to M1 & SC 37

**National Drivers**

Homeland Security Act of 2002 (Public Law 107-296)

Cyber Security R&D Act (Public Law 107-305)

USA PATRIOT Act of 2001 (Public Law 107-56)

Aviation and Transportation Security (Public Law 107-71 )

Enhanced Border Security and Visa Reform Act (Public Law 107-173)

**Impacts**

6 month development - FIPS PUB 201: Personal Identity Verification (PIV) of Federal Employees and Contractors -2005

6 month development - Registered Traveler Interoperability Consortium (RTIC) Specification – 2006

This timing was possible because these standards could reference timely M1 or SC 37 developed standards

# Nanotechnology Standardization

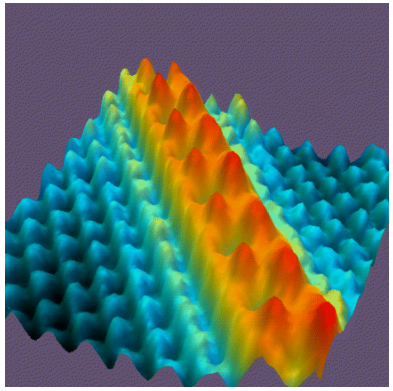


Image of single atomic zig-zag chain of Cs atoms (red) on the GaAs(110) surface.

### NIST Approach

Lead/participate in standards work in key venues: on terminology, exposure limits, instrument-based measurement

Provide needed data and expertise to support standard practices and test methods

Provide supporting reference materials

30 NIST staff in 6 labs

Internal coordination

**Result:** Timely availability of priority standards needed by government and industry

### Standards Drivers

Support R&D commercialization

Health, safety and environmental concerns

Facilitate trade

Stake out territory

### Key Int'l Standards Venues

Horizontal activities: ASTM E56, IEEE and SEMI roadmaps, IEC TC 113, ISO TC 229

"traditional" committees addressing nano-scale issues: ASTM E42 and others, ASME B89, IEEE product committees, ISO and IEC sector/application specific committees

Other: OECD, VAMAS

# Biofuels Standardization

**NIST Approach**

Sponsored Tripartite Task Force to compare major standards used in global trade

Leading standards policy discussions in Intl Biofuels Forum and US-EU Council

Leading tripartite government effort to develop needed global reference materials to support biofuels trade

**Result:** clear movement toward harmonized standards, greater government acceptance

**Drivers**

Governments seek secure affordable supplies of energy

US seeking 20% reduction in gas consumption by 2017

EU seeking minimum 10% use of biofuels by 2020

Brazil seeks to expand bioethanol exports

Business interests – producers & users do not agree

**Key Standards Venues**

ANSI Biofuels Standards Panel

ASTM International's D2 Committee

CEN TC 19

ABNT (Brazil)

ISO – efforts planned (TC 28, TC 34)

Infrastructure standards: API, ASME, UL, SAE

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